

Value-Added Tax (Vat) and Sustainable Development in Nigeria

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Abstract

This study examined the effective utilization of value-added tax revenues in improving sustainable development in Nigeria. The specific objectives of the study are to: (1) Evaluate the effect of Value-Added Tax (VAT) on sustainable development in Nigeria. (2) Assess the effect of Value-Added Tax (VAT) when used for recurrent spending on sustainable development in Nigeria. (3) Assess the effect of Value-Added Tax (VAT) when used for capital spending on sustainable development in Nigeria. The study further utilized data ranging from 1994 to 2024, with per capita income as a proxy for sustainable development, while using Value-Added Tax as the core variable and government recurrent expenditure, capital expenditure, together with their interaction variables, and inflation rate as control variables. The data were sourced from the World Development Indicators and the Central Bank of Nigerian Bulletin. The study adopted the Endogenous Growth Theory, which explains how long-run economic growth is generated from within an economy rather than driven solely by external factors. Analyzed using the Error Correction (ECM) approach, the study found that value-added tax (VAT) had a negative but statistically insignificant short-run effect on per capita income ($\beta = -0.0478$; $p = 0.3114$). This implies that increases in value-added tax revenue alone did not significantly improve sustainable development during the study period, suggesting that the developmental impact of value-added tax depends largely on how the revenue is utilized. Governments are advised to focus less on revenue mobilization alone and more on ensuring that value-added tax proceeds are channeled into productive and development-enhancing activities. Stronger monitoring, transparency, auditing and accountability mechanisms should be introduced to minimize leakages and ensure that value-added tax revenue contributes meaningfully to improvements in national income in Nigeria.

Keywords: Value-Added Tax, Development, Endogenous Growth, Government Expenditure, ECM

1. Introduction

In Nigeria, value-Added Tax (VAT) has become one of the most important sources of government revenue. This is true for developing countries seeking to diversify their fiscal base away from volatile sources of revenue such as natural resources. Introduced in Nigeria as a consumption-based tax levied on the value added at each stage of production and distribution, Value-Added Tax (VAT) is widely regarded as efficient, transparent, and relatively easy to administer compared to other forms of taxation (Bird & Gendron, 2007). In Nigeria, there is a

persistent concern that Value-Added Tax and other public sector revenues are not optimally utilized to achieve desired developmental outcomes. The National Bureau of Statistics justifies the growing trend in the amount of Nigeria's Value-Added Tax revenues in recent times. Being a country with strong and dedicated institutions, the growing amount of revenue from Value-Added Tax in recent times, as shown in the diagram, should be used to improve the economy but certain issues are fighting its effectiveness in Nigeria; issues such as corruption, inefficiency in public spending, weak institutional frameworks, and poor accountability mechanisms have been identified as major impediments to effective resource utilization (Oladipo & Akinbobola, 2011). Muniru (2025) found that weak administration of Value-Added Tax resources limits its effective utilization in an economy, while Biaze et al (2025) further discovered that good value-added tax reforms significantly improve growth outcomes. In Nigeria, there is a persistent concern that Value-Added Tax (VAT) proceeds and other government revenues are not optimally utilized to achieve desired developmental outcomes, such as improving human capital and average income of households. The introduction of Value-Added Tax into the Nigerian public finance system is to improve the average income of households, social and environmental protection. Policies geared towards these three key areas of sustainable development are made possible by the level of public expenditures and the generated Value-Added Tax, including other public revenues. Unfortunately, issues like corruption, inefficiency in public spending, weak institutional frameworks, and poor accountability mechanisms have continued to impede effective resource utilization for sustainable development in Nigeria. The observed trends in Figure 1.1 further exemplify and justify the problem. The trends reveal a modest and somewhat unstable pattern in human capital development, as proxied by primary school enrolment rates, which fluctuated over the period despite a generally increasing trajectory in capital expenditure in Nigeria. While capital expenditure rose steadily, peaking around the early 2020s before declining slightly, human capital outcomes did not exhibit a commensurate or sustained improvement, suggesting a weak transmission mechanism.

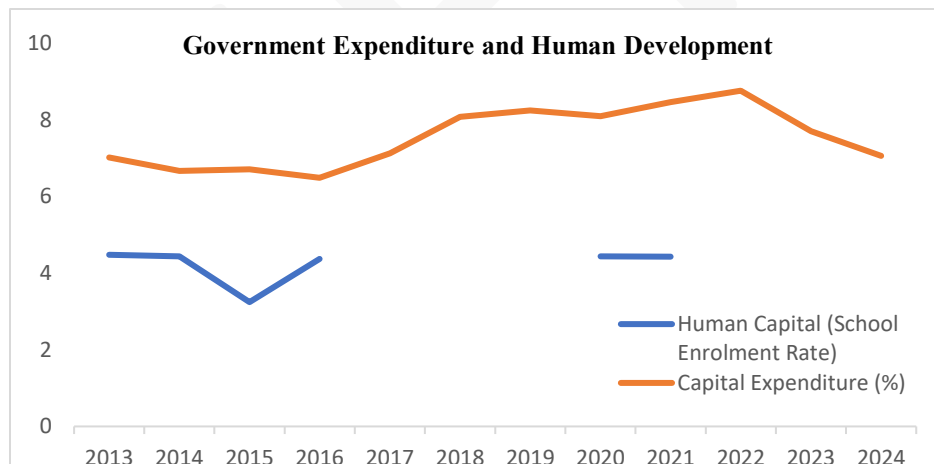


Figure 1. Stylized Facts on Government Expenditure and Human Development
Source: *World Bank and CBN Data, 2026*

At the same time, Value-Added Tax revenue shows a consistent upward quarterly trend, indicating growing fiscal capacity; however, the lack of a strong corresponding rise in human capital implies that increased Value-Added Tax inflows have not been efficiently translated into meaningful developmental outcomes. This disconnect highlights a critical problem such that the

effective utilization of Value-Added Tax may be constrained not by revenue generation, but by the inefficiency and the poor quality of its allocation towards capital projects and recurrent expenses that directly or indirectly enhance sustainable development indicators in Nigeria. The study, therefore, seeks to investigate the level of effective utilization of Value-Added Tax, with data ranging between 1994 and 2024 and an Error Correction (ECM) framework so as to fill in the gaps existing in literature.

Current empirical research revealed a clear and important gap on the relationship between Value-Added Tax and sustainable development in Nigeria. While several Nigerian studies extensively examine public expenditure, particularly the impacts of capital and recurrent spending on economic growth, they largely omit explicit consideration of Value-Added Tax as a key source of financing, since the introduction of the Value-Added Tax in 1994. Moreover, most studies treat revenue generation and expenditure allocation as separate issues, rather than examining their interaction, thereby neglecting how effectively Value-Added Tax revenue is translated into productive public spending. All these create significant gaps that justify the present study, which uniquely integrates Value-Added Tax, expenditure, Value-Added Tax effectiveness, and macroeconomic stability within a dynamic estimation framework. Hence, the main objective of the study is to investigate the effective utilization of Value-Added Tax (VAT) on sustainable development in Nigeria. Specifically, the research aims to:

1. Evaluate the effect of Value-Added Tax (VAT) on sustainable development in Nigeria.
2. Assess the effect of Value-Added Tax (VAT) when used for recurrent spending on sustainable development in Nigeria.
3. Assess the effect of Value-Added Tax (VAT) when used for capital spending on sustainable development in Nigeria.

Flowing from the specific objectives, three hypotheses are stated for econometric testing. In their null forms, the hypotheses are expressed as follows:

H₀₁: There is no significant effect of Value-Added Tax (VAT) on sustainable development in Nigeria.

H₀₂: Value-Added Tax (VAT), when used for recurrent spending, does not have a significant effect on sustainable development in Nigeria.

H₀₃: Value-Added Tax (VAT), when used for capital spending, does not have a significant effect on sustainable development in Nigeria.

2. Literature Review

2.1. Conceptual Review

2.1.1. Value-Added Tax (VAT)

Value-Added Tax (VAT) in Nigeria is an indirect tax levied on the consumption of goods and services at each stage of production and distribution. It is fundamentally a consumption-based tax, meaning the final burden is borne by the ultimate consumer rather than by producers or intermediary firms. Value-Added Tax (VAT) is charged on the value-added to goods and services as they move through the supply chain, with businesses acting as collection agents on behalf of the government (Saidu, Adda & Akingbolu, 2024). This structure makes Value-Added Tax distinct from direct taxes such as income tax, as it targets expenditure rather than earnings. In Nigeria, Value-Added Tax was introduced through Decree No. 102 of 1993 and became operational in 1994, replacing the earlier sales tax system (Aanu, 2024). The legal framework governing Value-Added Tax was historically anchored on the Value-Added Tax Act (Cap V1, LFN 2004), although recent reforms under the Nigeria Tax Act (2025) have updated its

administration and compliance structure (BDO, 2026; Baker McKenzie, 2026). These reforms reflect the dynamic nature of Nigeria's tax system and the government's effort to improve revenue mobilization and efficiency. A key feature of the Value-Added Tax system is the input-output mechanism. Businesses charge Value-Added Tax on their sales (output Value-Added Tax) and are allowed to deduct Value-Added Tax paid on their purchases (input Value-Added Tax), remitting only the net amount to the government. This mechanism prevents double taxation and ensures that tax is only paid on the value added at each stage of production (BDO, 2026). It also enhances transparency and accountability in the tax system. From a macroeconomic perspective, Value-Added Tax plays a crucial role in Nigeria's fiscal policy and development strategy. It is considered one of the fastest-growing sources of non-oil revenue, especially in the context of declining oil revenues and the need for economic diversification (Aanu, 2024).

Consequently, Value-Added Tax has become central to financing public expenditure, including infrastructure, education, and healthcare, which are critical components of sustainable development. Despite its advantages, Value-Added Tax in Nigeria faces several challenges. These include administrative inefficiencies, tax evasion, compliance costs for businesses, and ongoing legal disputes over the jurisdiction of Value-Added Tax collection between federal and state governments. For instance, recent judicial controversies have questioned whether Value-Added Tax should be centrally administered or devolved to sub national governments, reflecting broader fiscal federalism issues (Nwankwo & Nwankwo, 2025). Additionally, the regressive nature of Value-Added Tax, where lower-income individuals bear a higher proportion of their income in taxes, remains a concern, although exemptions help mitigate this effect. Moreover, Value-Added Tax in Nigeria is a critical fiscal instrument designed to generate revenue through consumption taxation while promoting economic stability and development. Its effectiveness, however, depends largely on efficient administration, equitable policy design, and the productive utilization of the revenue generated. This makes Value-Added Tax not only a revenue tool but also a key determinant of sustainable development outcomes in Nigeria.

2.1.2. Sustainable Development

Sustainable development is a multidimensional concept that integrates economic growth, social inclusion, and environmental protection to ensure long-term human well-being. The most widely accepted definition originates from the Brundtland Commission, which defines sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, WCED, 1987). This definition highlights the intergenerational responsibility embedded in development planning and underscores the need for a balance between present consumption and future resource availability. Over time, the concept has evolved into a global development framework, particularly with the adoption of the Sustainable Development Goals (SDGs) in 2015, which emphasize the interdependence of economic, social, and environmental dimensions (Prabhakara, 2023). Focusing on the economic dimension, sustainable development goes beyond mere increases in output or income to encompass qualitative improvements in economic systems. It involves achieving sustained economic growth while ensuring efficient resource allocation, reduced inequality, and long-term stability. Economic sustainability is concerned with maintaining or increasing the stock of capital, both physical and human, while ensuring that economic activities do not undermine future productive capacity (Prabhakara, 2023). This implies that economic policies should promote not only growth but also structural transformation, employment generation, poverty reduction, and improved standards of living.

Thus, sustainable economic development is not simply about expanding GDP but about enhancing the overall welfare of society in a durable manner.

Sustainable economic development requires a balance between growth and resource efficiency. It prioritizes long-term productivity, innovation, and resilience over short-term expansion (Lapinskienė, 2025). This perspective recognizes that unchecked economic growth can lead to environmental degradation and social inequality, thereby undermining sustainability. Consequently, the economic dimension of sustainable development promotes investment in critical sectors such as infrastructure, education, health, and technology, which enhance human capital and support inclusive growth. It also stresses the importance of economic diversification, especially for developing countries like Nigeria, where reliance on a single revenue source (such as oil) poses risks to long-term stability. Moreover, sustainable economic development incorporates the principles of inclusiveness and equity. It seeks to ensure that economic growth translates into broad-based benefits such as job creation, income distribution, and poverty alleviation. According to Tangorn (2025), a sustainable economy generates income, distributes it fairly, minimizes inequality, and improves the quality of life of its citizens. This aligns with key SDGs such as no poverty, decent work and economic growth, and reduced inequalities. Therefore, economic sustainability is not only about efficiency but also about fairness and social justice. Another critical aspect of the economic dimension is resilience. Sustainable development requires economic systems that can withstand shocks such as financial crises, pandemics, and climate-related disruptions. This involves strengthening institutions, promoting sound fiscal policies, and ensuring prudent management of public resources. In this context, public revenue sources like taxation (including Value-Added Tax) become essential tools for financing sustainable development initiatives. The efficient utilization of such revenues, particularly in productive sectors, is crucial for achieving long-term economic sustainability. Therefore, sustainable development, from an economic perspective, entails a comprehensive approach to growth that integrates efficiency, equity, and stability. It emphasizes not only the expansion of economic output but also the quality, inclusiveness, and sustainability of that growth. For countries like Nigeria, achieving sustainable development requires effective fiscal management, strategic investment in capital projects, and policies that ensure that economic gains are widely shared and preserved for future generations.

2.2. Endogenous Growth Theory

Endogenous Growth Theory explains how long-run economic growth is generated from within an economy rather than driven solely by external factors. Endogenous growth theory internalizes technological change by explaining it as a result of intentional investment decisions, innovation, and knowledge accumulation within the economy (Romer, 1986; Lucas, 1988). The central premise is that economic growth is sustained by factors such as human capital, innovation, research and development (R&D), and knowledge spillovers, all of which are generated within the economic system. The endogenous growth theory was developed partly as a response to the Solow-Swan model, which treats technological progress as exogenous, coming from outside the model, unexplained. Endogenous growth theory instead argues that growth is driven by factors internal to the economic system, such as investment in capital (including human capital and knowledge), which can generate constant or even increasing returns rather than the diminishing returns assumed by Robert Solow. The simplest and most widely taught version of the endogenous theory is the AK model. The letter A stands for the technology/productivity parameter, while K stands for capital.

The technological parameter (A) is treated as a constant (not diminishing), representing the level of technology or the marginal productivity of capital. Unlike Solow's model, A is not separate from capital accumulation; A reflects the idea that capital (broadly defined) does not run into diminishing returns because it includes knowledge, human capital, and spillover effects, which do not deplete the way physical capital alone would. On the other hand, capital (K) is not just physical capital (machines, buildings); it is a broad aggregate that can include human capital, knowledge, and infrastructure. Because K is defined broadly, the economy avoids the diminishing marginal returns to capital that occur in the Solow model when K is narrowly physical. The production function is expressed as:

$$Y = AK$$

Where:

Y = aggregate output

A = constant marginal product of capital (technology parameter)

K = aggregate (broad) capital stock

This is a linear production function in K. We can notice that there is no exponent less than 1 on K, unlike the Cobb-Douglas form used in the Solow model ($Y = AK^\alpha L^{1-\alpha}$, with $0 < \alpha < 1$). The absence of diminishing returns to K is the defining mathematical feature of the endogenous (AK) model. For the mathematical derivation of the growth result, assume a constant savings rate s, and capital depreciation rate δ . Capital accumulation is expressed as:

$$\Delta K = sY - \delta K$$

Substituting $Y = AK$

$$\text{Therefore, } \Delta K = sAK - \delta K$$

Dividing through by K to get the growth rate of capital

$$\Delta K/K = sA - \delta$$

Since $Y = AK$, output grows at the same rate as capital

$$\Delta Y/Y = \Delta K/K = sA - \delta$$

Looking at the key implication of the model, notice that the growth rate ($sA - \delta$) is constant over time; it does not shrink as the economy accumulates more capital, because there is no diminishing returns term pulling it down. This contrasts sharply with the Solow model, where growth eventually converges to zero (per capita) in the absence of exogenous technological change, since diminishing returns to capital cause the growth rate to fall as K rises. In the AK model, policy variables that raise the savings rate s (such as investment incentives, education spending that raises the level of the A parameter) can permanently raise the long-run growth rate. This is why the theory is called "endogenous". That is, growth is explained by variables determined within the economic system (such as savings behaviour, capital accumulation, government policy), not by an unexplained external technology trend.

2.3 Empirical Review

Olaoye and Olatunji (2025) examined the Empirical Analysis of Tax Revenue and Government Spending in Nigeria from 2013–2022, using variables such as tax revenue, Value-Added Tax, and government consumption expenditure. The study employed descriptive and inferential statistical techniques. One key finding was that Value-Added Tax significantly influences government consumption expenditure, indicating a strong linkage between indirect tax revenue and fiscal operations. The authors recommended that policymakers should improve tax administration and ensure efficient allocation of tax revenue to productive sectors.

Biaze, Kpolode, and EkioDiribo (2025) focused on Fiscal Policy (Value-Added Tax) Reform and Economic Growth: Empirical Evidence of Nigeria from 2020–2023, using Value-Added Tax reform indicators and GDP as variables and applying regression analysis. The study found that Value-Added Tax reforms have a statistically significant impact on economic growth, reflecting the role of Value-Added Tax policy adjustments in influencing fiscal outcomes. The authors recommended that government should adopt gradual and well-structured Value-Added Tax reforms to avoid distortions while enhancing revenue performance.

Similarly, Ubali, Ihendinihu, Okezie and Alpheaus. (2025) carried out a Sectorial Analysis of Value-Added Tax Contribution to Economic Growth of Nigeria with data spanning multiple years up to 2024, focusing on sectoral Value-Added Tax contributions from manufacturing, agriculture, mining, and financial services. The study employed econometric analysis (regression techniques) using Value-Added Tax disaggregated by sector and GDP as variables. One major finding was that Value-Added Tax contributions from key sectors significantly influence economic growth, with manufacturing and financial services showing stronger impacts compared to agriculture. The study recommended that government should strengthen sector-specific tax policies and support high-performing sectors to maximize Value-Added Tax productivity and economic growth. In addition, Muniru (2025) carried out a Critical Analysis of Value Added Tax System in Nigeria and adopted a literature review method, with a focus on institutional and legal frameworks rather than time-series data. Although not purely econometric, the study highlighted that inefficiencies in Value-Added Tax administration, such as low compliance, weak data systems, and legal conflicts, limit the effectiveness of Value-Added Tax as a revenue tool. It recommended constitutional reforms, improved taxpayer data systems, and stronger enforcement mechanisms to enhance Value-Added Tax performance. Chijuka and Izeke (2025) also examined Tax Revenue and Economic Growth in Nigeria from 2015–2023. The study utilized real GDP growth as the dependent variable and Petroleum Profit Tax (PPT), Customs and Excise Duties (CED), and a composite VAT-CIT index as explanatory variables. Using regression analysis, the study found that all tax revenue components positively and significantly contributed to economic growth, with the VAT-CIT component exerting a meaningful positive influence. The authors recommended strengthening tax administration and broadening the tax base to increase government revenue for sustainable development. Amobi and Amobi (2025) further conducted a study on the Causal Links between Tax Revenue, Government Expenditure, and Economic Growth, following a Wavelet a Approach. The study covered 1981 to 2020 using monthly data. Variables used included tax revenue, government expenditure, and economic growth. The study employed Wavelet Decomposition and Wavelet Granger Causality techniques. A key finding was the existence of a bidirectional causal relationship between government expenditure and economic growth in the long run, indicating that fiscal policy and economic performance reinforce each other over time. The study recommended that governments coordinate tax and expenditure policies to achieve sustainable economic growth.

Dabor, Adamu, and Ogujiofor (2025) went further to examine Tax Revenue and Economic Growth in Nigeria, following a theoretical and empirical review. The study analyzed data from 1995 to 2022. Variables studied include Value Added Tax (VAT), Company Income Tax (CIT), Customs and Excise Duties (CED), and economic growth. The study employed the Vector Error Correction Model (VECM). A major finding was that Value Added Tax (VAT) had a positive and significant impact on economic growth in both the short run and the long run, whereas some other tax components exhibited negative effects. The authors recommended strengthening tax administration and closing tax leakages to improve the contribution of Value Added Tax (VAT) to

economic growth in Nigeria.

Oto and Wayas (2024) went further to investigate Value-Added Tax and Economic Growth of Nigeria, focusing on the relationship between Value-Added Tax and macroeconomic aggregates using time-series data from 2003–2022. The variables included Value-Added Tax revenue, total government revenue, total government expenditure, and GDP, and the study employed simple regression and descriptive statistics. One key finding was that Value-Added Tax has a statistically significant relationship with government expenditure and overall economic performance, indicating its importance as a fiscal tool. The authors recommended that government should strengthen Value-Added Tax administration and broaden the tax base to enhance revenue mobilization and support public expenditure. Werigbelegha and Esther (2024) carried out an Empirical Investigation of Government Expenditure and Taxpayers' Compliance in Nigeria between 1992 and 2022, using variables such as capital expenditure, recurrent expenditure, Value-Added Tax compliance, company income tax compliance, and GDP. The methodology involved time-series econometric techniques. A key finding of the study was that government expenditure, particularly capital spending, significantly improves economic performance, while tax compliance (including Value-Added Tax) is influenced by how government spends public funds. The authors recommended that government should enhance transparency and accountability in expenditure to improve taxpayer compliance and boost revenue generation. Mainoma and Izang (2024) further analysed the Effect of Tax Revenue on Fiscal Sustainability in Nigeria for the period 2016–2024 using variables such as Value-Added Tax (VAT), company income tax (CIT), petroleum profit tax (PPT), and debt-to-GDP ratio as a proxy for fiscal sustainability. The study adopted an ex post facto design and Ordinary Least Squares (OLS) regression technique. A key finding of the study was that value-added tax (VAT) exerts a significant positive effect on the debt-to-GDP ratio, indicating that increased Value-Added Tax revenue is associated with rising fiscal obligations and debt levels in Nigeria. The authors recommended that government should complement Value-Added Tax revenue with prudent fiscal management and debt control strategies to ensure long-term sustainability.

In another important contribution, Korolo and Korolo (2024) further examined the Federally Collected Taxes and Economic Growth in Nigeria. The study used a long-time frame (1994–2023) but remains relevant due to its recent publication. The variables included Value-Added Tax, customs duties, petroleum profit tax, company income tax, and real GDP. The study adopted the Vector Error Correction Model (VECM) to capture both short- and long-run dynamics. A key finding was that federally collected taxes, including Value-Added Tax, exhibit both short-run and long-run relationships with economic growth, confirming that tax revenue is a critical driver of macroeconomic performance in Nigeria. The authors recommended that government should enhance tax administration efficiency and reduce leakages to strengthen the growth impact of tax revenue. Studies above reveal a clear and important gap on the relationship between Value-Added Tax and sustainable development in Nigeria. While several Nigerian studies extensively examine public expenditure, particularly the impacts of capital and recurrent spending on economic growth, they largely omit explicit consideration of Value-Added Tax as a key source of financing, since the introduction of the Value-Added Tax in 1994. Moreover, most studies treat revenue generation and expenditure allocation as separate issues, rather than examining their interaction, thereby neglecting how effectively Value-Added Tax revenue is translated into productive public spending. All these create significant gaps that justify the present study, which model per capita income (a proxy for sustainable development) as a function value-added tax (tax) while also including government capital expenditure, recurrent expenditure, interaction of

VAT and government expenditure, and inflation rate. This is to evaluate and understand how effective value-added tax revenue can be utilized in recurrent and capital projects in Nigeria.

3. Methodology

The research employs the *ex-post facto* research design. According to Onwuemere (2009), This is a type of research design involving events that have already taken place. Data exists as no attempt can be made to control or manipulate relevant independent/explanatory variables in the study. This type of research design aims at determining and measuring relationships between one variable known as the dependent variable and the others known as independent/explanatory variables. The data for the research range between 1994 and 2024 for uniformity the dataset, since Value-Added Tax was introduced in 1994. The study further adopts the error correction model (ECM). The error correction model a popular model that has been used by different authors in investigating the relationship between taxation and economic growth and development. For instance, Onifade, Çevik, Erdoğan, Asongu and Bekun (2020) utilized the Bounds Error Correction Model (ECM) to analyze the Impact of Public Expenditures on Economic Growth in Nigeria. Furthermore, Ajayi and Sopelu (2018) utilized the Bounds Error Correction Model to carry out an Empirical Analysis of Value Added Tax on Economic Growth in Nigeria. The authors that utilized the Bounds ECM understood the efficiency of the model in analyzing variables with a mix of stationarity, 1(0) and 1(1), whether cointegration exists or not among the variables of interest.

3.1 Model Specifications

Evaluating the specific objectives, the study adapted the endogenous growth theory and the model specified by Olaoye and Olatunji (2025), who carried out an empirical analysis of tax revenue and government spending in Nigeria for the period of 2012-2023. Their model is specified as:

$$GCE = f(TTR, VAT) \dots\dots\dots (1)$$

Where GCE = Government Consumption Expenditure; TTR = Total Tax Revenue; VAT = Value-added Tax.

To investigate the relationship between value-added tax (VAT) and sustainable development in this study, the model in eqn (1) is transformed as:

$$SD_t = f(VAT_t, RECEXP_t, CAPEXP_t, X_t) \dots\dots\dots (2)$$

Where SD = Sustainable development indicator (proxied by Gross Domestic Product Per Capita (GDPPC)); VAT = Total Value Added Tax revenue; RECEXP = Recurrent expenditure; CAPEXP = Capital expenditure; X = Control variable (inflation). Taking log of variables in their absolute forms, the econometric form of the model is expressed as:

$$\ln SD_t = \beta_0 + \beta_1 \ln VAT_t + \beta_2 \ln RECEXP_t + \beta_3 \ln CAPEXP_t + \beta_4 X_t + \mu_t \dots\dots\dots (3)$$

To investigate the effective utilization of value-added tax (VAT) in achieving sustainable development, the model in eqn (3) is transformed to accommodate the interaction terms as:

$$\ln SD_t = \beta_0 + \beta_1 \ln VAT_t + \beta_2 \ln RECEXP_t + \beta_3 \ln CAPEXP_t + \beta_4 (\ln VAT_t \times \ln CAPEXP_t) + \beta_5 (\ln VAT_t \times \ln RECEXP_t) + \beta_6 \ln INF_t + \mu_t \dots\dots\dots (4)$$

Where β_0 = Intercept; β_{1-6} = parameter coefficients; β_4 = Effect of Value-Added Tax (VAT) when used for capital projects; β_5 = Effect of Value-Added Tax (VAT) when used for recurrent spending. In terms of the a priori, we expect VAT and CAPEXP to have a positive relationship with sustainable development; VAT*RECEXP is expected to have a negative relationship, we

expect mixed relationships from RECEXP, VAT*CAPEXP, and INF. Hence, the parameter signs can be expressed as: β_1 and $\beta_3 > 0$; $\beta_5 < 0$; $\beta_2, \beta_4, \beta_6 < \text{or} > 0$.

4. Results and Discussion

4.1 Results

Table 1. Unit Root Results

Variables	ADF-Test at levels	5% critical value	ADF-Test at 1 st Diff.	5% critical value	Order of Integration	Remarks
PCI	-1.95191	-3.56837	-5.65958	-3.57424	1(1)	Stationary
VAT	-1.46193	-3.58062	-3.91374	-3.57424	1(1)	Stationary
RECEXP	-2.00576	-2.96397	-3.06771	-2.96776	1(1)	Stationary
CAPEXP	-3.86870	-3.60320			1(0)	Stationary
VAT*CAPEXP	-3.661411	-3.595026			1(0)	Stationary
VAT*RECEXP	-2.396960	-3.568379	-3.41075	-3.57424	1(1)	Stationary
INF	-6.163073	-2.963972			1(0)	Stationary

Source: E-View Output, 2026

The table above indicates that PCI, VAT, RECEXP, and VAT×RECEXP are stationary after first differencing, as their first-difference ADF statistics exceed the corresponding 5% critical values in absolute terms, indicating that they are I(1). In contrast, CAPEXP, VAT×CAPEXP, and INF are stationary at levels, making them I(0) variables. The results therefore establish a combination of I(0) and I(1) variables, with none being I(2), which satisfies an important precondition for estimating an ARDL model and subsequently deriving the Error Correction Model (ECM).

Table 2: Bounds Cointegration Test

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	1.777443	6

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61
2.5%	2.75	3.99
1%	3.15	4.43

Source: E-View Output, 2026

The ARDL Bounds test result shows an F-statistic of 1.7774 with six explanatory variables ($k =$

6). The computed F-statistic is below the lower-bound critical value of 2.12 at 10%, 2.45 at 5%, 2.75 at 2.5%, and 3.15 at 1% significance levels. Therefore, the null hypothesis of no long-run relationship cannot be rejected at any of the reported significance levels. This implies that there is no statistically significant long-run relationship between sustainable development (proxied by per capita income), value-added tax (VAT), and other control variables over the study period. Consequently, the evidence does not support the existence of a stable long-run equilibrium relationship among the variables, although the short-run part of the model is examined in the study.

Table 3: Error Correction Model Results for the Research Objectives

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPCI(-1))	0.619145	0.079589	7.779310	0.0000
D(LNVAT)	-0.047756	0.046950	-1.017156	0.3114
D(LNRECEXP)	0.596568	0.141861	4.205294	0.0001
D(LNRECEXP(-1))	-0.469809	0.142432	-3.298466	0.0013
D(LNCAPEXP)	-0.890973	0.145417	-6.127007	0.0000
D(LNCAPEXP(-1))	0.692687	0.135148	5.125397	0.0000
D(LNVAT LNCAPEXP)	0.142368	0.024147	5.895896	0.0000
D(LNVAT LNCAPEXP(-1))	-0.107732	0.023805	-4.525689	0.0000
D(LNVAT LNRECEXP)	-0.087273	0.019524	-4.470171	0.0000
D(LNVAT LNRECEXP(-1))	0.067710	0.019528	3.467419	0.0008
D(INF)	-0.000507	0.000740	-0.684693	0.4950
Co-int. Eq(-1)	-0.020658	0.016590	-1.245230	0.2158

Source: Extracts From E-View Computations, 2026

The Error Correction Model (ECM) results provide evidence on the short-run effects of value-added tax (VAT), recurrent expenditure, capital expenditure, and their interaction with value-added tax (VAT) on sustainable development in Nigeria, with sustainable development proxied by per capita income. The coefficient of the differenced value-added tax (VAT) variable is -0.0478 , with a probability value of 0.3114. This indicates that value-added tax (VAT) revenue has a negative but statistically insignificant short-run effect on per capita income. In practical terms, increases in value-added tax (VAT) revenue, by themselves, did not significantly translate into improvements in the country's per capita income during the period covered by the study. The immediate interaction term has a coefficient of -0.0873 and is statistically significant ($p = 0.0000$), while its one-period lag has a coefficient of 0.0677 and is also significant ($p = 0.0008$). The negative immediate coefficient indicates that the combined effect of value-added tax (VAT) and recurrent expenditure initially reduces per capita income, whereas the positive lagged coefficient suggests that part of this effect may reverse in the following period.

This alternating pattern implies that the utilization of value-added tax (VAT) through recurrent spending does not produce a stable or consistently positive developmental outcome. However, the immediate interaction coefficient of VAT and capital expenditure is 0.1424 and statistically significant ($p = 0.0000$), whereas its lagged coefficient is -0.1077 , also significant ($p = 0.0000$). The positive immediate interaction indicates that when value-added tax revenue is combined with capital expenditure, there is an immediate positive effect on per capita income, suggesting that productive capital utilization can enhance the developmental value of value-added tax revenue. However, the negative lagged interaction indicates that this positive effect is not

sustained uniformly over time. The alternating signs may reflect delays, inefficiencies, cost overruns, or differences in the productivity of public capital projects.

4.2 Evaluation of Research Hypotheses

Hypotheses	p-value	Decision
H₀₁: There is no significant effect of Value-Added Tax (VAT) on sustainable development in Nigeria.	0.3114	Accept null hypothesis because p-value is greater than 0.05 level.
H₀₂: Value-Added Tax (VAT), when used for recurrent spending, does not have a significant effect on sustainable development in Nigeria.	0.0000	Reject null hypothesis, since p-value is less than 0.05 level.
H₀₃: Value-Added Tax (VAT), when used for capital spending, does not have a significant effect on sustainable development in Nigeria.	0.0000	Reject null hypothesis, since p-value is less than 0.05 level.

Source: Authors Compilation, 2026

4.3 Discussion of Findings

With respect to the first specific objective, the finding that value-added tax (VAT) has a negative but statistically insignificant effect on sustainable development suggests that increasing VAT collections should not automatically be regarded as evidence of improved development. The policy implication is that government should be cautious about relying on increases in value-added tax rates or aggressive revenue mobilization as an independent strategy for improving living standards. What matters is whether additional value-added tax revenue is converted into productive public services and investments that raise productivity and per capita income. This interpretation is consistent with Oto and Wayas (2024), who found that value-added tax revenue was significantly associated with government expenditure but noted that its contribution could not be directly traced to specific expenditure areas such as health, education or salaries. They consequently recommended allocating a proportion of value-added tax revenue to critical sectors such as agriculture, power and health. The significant interaction between value-added tax (VAT) and recurrent expenditure also suggests the need for greater expenditure traceability. Government should be able to demonstrate how value-added tax revenue contributes to salaries, public administration, education, healthcare, security and other recurrent services. Where such spending improves the quality of public services and human productivity, it can contribute to development; where it merely finances administrative expansion or waste, its developmental effect is likely to be weak. This is particularly important because Nigerian evidence shows that government expenditure has sometimes failed to translate into corresponding improvements in output, with misappropriation, corruption and weak supervision identified as possible explanations.

Consequently, public financial management reforms should include expenditure monitoring, procurement transparency, independent auditing and outcome-based budgeting. The positive immediate interaction between value-added tax (VAT) and capital expenditure provides an even stronger policy justification for earmarking or strategically prioritizing part of VAT-generated resources for high-return capital projects. However, the negative lagged interaction cautions against assuming that every capital project automatically produces sustainable development. The quality, completion, maintenance and productivity of the project are critical. Government should therefore introduce rigorous project appraisal, cost-benefit analysis, competitive procurement, monitoring and post-completion evaluation. This is consistent with the recommendation of the

World Bank that improved public financial management should ensure that public resources generate value through investments in areas such as infrastructure, education and health. The policy focus should consequently shift from simply increasing capital expenditure to increasing the efficiency of capital expenditure.

5. Conclusion and Recommendations

The study concludes that value-added tax (VAT) revenue, on its own, does not have a significant effect on sustainable development in Nigeria, as measured by per capita income. This suggests that increasing value-added tax revenue without ensuring its productive utilization may not translate into meaningful improvements in economic welfare. The study also concludes that the utilization of value-added tax through recurrent expenditure has a significant but mixed short-run effect on sustainable development. While recurrent spending can stimulate economic activity in the immediate period, its negative lagged effect suggests that excessive reliance on consumption-oriented expenditure may weaken sustained improvements in per capita income in Nigeria. Further, the study concludes that value-added tax utilization through capital expenditure significantly affects sustainable development, although the effect varies over time. The negative immediate effect and positive lagged effect indicate that capital investments may impose short-term costs but generate developmental benefits as productive infrastructure and other capital projects become operational. This research recommends the following:

1. Government should focus less on revenue mobilization alone and more on ensuring that value-added tax proceeds are channeled into productive and development-enhancing activities. Stronger monitoring, transparency, auditing and accountability mechanisms should be introduced to minimize leakages and ensure that value-added tax revenue contributes meaningfully to improvements in national income in Nigeria.
2. Government should control non-essential administrative and consumption-oriented spending while protecting recurrent expenditure that directly supports productive capacity, particularly education, healthcare, skills development and maintenance of public infrastructure. This would help ensure that VAT-funded recurrent spending produces lasting economic benefits rather than merely increasing government consumption.
3. More so, government advised to increase investment in high-impact infrastructure such as electricity, transportation, water supply, digital infrastructure and productive agricultural facilities. Project selection should be based on cost-benefit analysis, while effective monitoring should ensure timely completion, quality implementation and maintenance of projects so that their expected long-term benefits are realized.

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